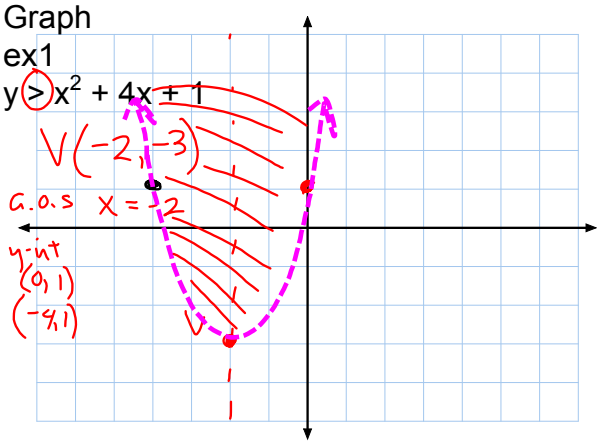
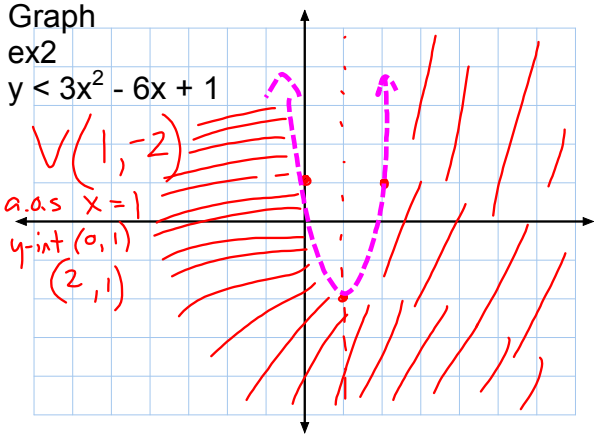
6-7 Quadratic Inequalities

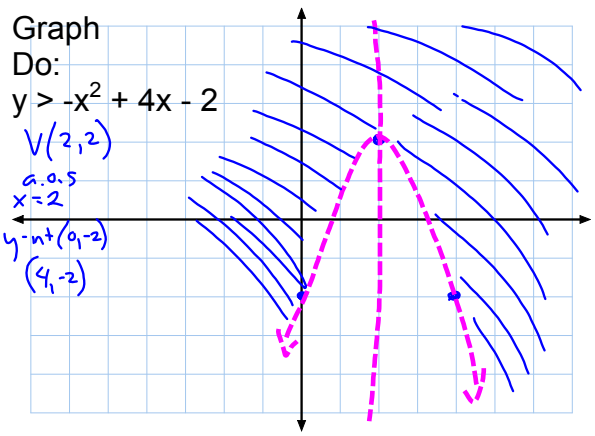
Graph
ex1
$y > x^2 + 4x + 1$



Graph
ex2
$y < 3x^2 - 6x + 1$



Graph
Do:
$y > -x^2 + 4x - 2$

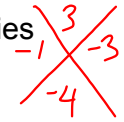


Solving Quadratic Inequalities

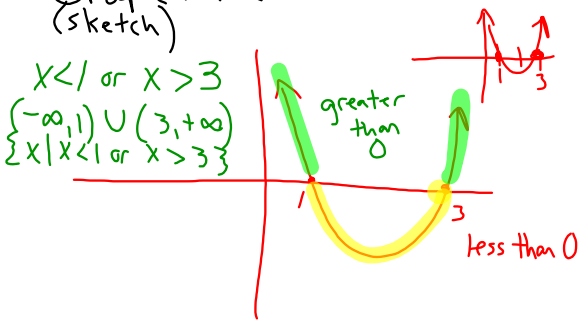
Ex 1

$x^2 - 4x + 3 > 0$

$(x-3)(x-1) > 0$



Graph the related function (sketch)



$x < 1$ or $x > 3$

$(-\infty, 1) \cup (3, +\infty)$

$\{x \mid x < 1 \text{ or } x > 3\}$

Ex 2

$0 \leq -4x^2 - 17x - 15$

$0 \geq 4x^2 + 17x + 15$

$0 = 4x^2 + 17x + 15$

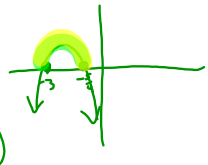
$4x^2 + 5x + 12x + 15$

$x(4x+5) + 3(4x+5)$

$0 = (4x+5)(x+3)$

$x = -\frac{5}{4}$ $x = -3$

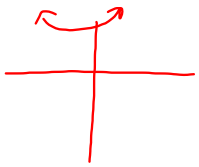
$-3 \leq x \leq -\frac{5}{4}$



Ex 3

$x^2 + 3x + 9 > 0$

$\mathbb{R}$



Ex 4

$x^2 + 3x + 9 < 0$

$\varnothing$

ex 5:
$-2x^2 + 12x - 9 < 0$

Quadratic Formula

$x = \frac{-6 \pm 3\sqrt{2}}{-2}$

$\frac{-6+3\sqrt{2}}{-2} \approx .878$

$\frac{-6-3\sqrt{2}}{-2} \approx 5.121$

$x < \frac{-6+3\sqrt{2}}{-2}$ OR $x > \frac{-6-3\sqrt{2}}{-2}$

In General:

p333-334
17, 19, 20, 31-41odd, 42
(when solving, use a calc. to graph)